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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/708,301

02/23/2004

Akira Kuibira

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29453

7590

05/31/2006

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EXAMINER

PAIK, SANG YEOP

ART UNIT

PAPER NUMBER

3742

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/708,301

Applicant(s)

KUIBIRA ET AL.

Examiner

Sang Y. Paik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 3, 4, 6 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanan et al (US 6,663,189) in view of Hiramatsu et al (US 6,507,006) or Ito et al (US 6,717,116).

Ramanan shows the structure claimed including a ceramic susceptor made of silicon carbide having the thermal conductivity of 100 w/mk or more with a resistive heating element present more toward the side opposite to the retaining side of the susceptor which has a flatness less than 500 um or less with a diameter 200 mm or more, a heat-reflecting metal plate (26) having the thermal conductivity greater than that of the ceramic susceptor mechanically attached and bonded to the susceptor wherein the thickness of the metal plate is greater than that of the ceramic susceptor. However, Ramanan does not explicitly show the heating element having a circuit pattern with a spacing of .1 mm or more.

Hiramatsu or Ito shows a heating circuit pattern having a through hole having the diameter of more than .1 mm between the circuit patterns. In view of Hiramatsu or Ito, it would have been obvious to one of ordinary skill in the art to adapt Ramanan with the circuit pattern having the spacing pattern more than .1 mm not only to prevent a short circuit between the

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heating pattern but also to provide an adequate spacing to incorporate the through holes for lifting pins or the holes for displacing thermocouples therein.

With respect to claim 2, Ramanan shows the metal plate and the ceramic susceptor being fastened to each other. Furthermore, it is noted that claim 2 is a product by process claim wherein the patentability is determined by the product and not by the process by which it is made.

With respect to claims 4 and 11, Hiramatsu shows that the ceramic susceptor can be made of silicon carbide, aluminum nitride as well as alumina and boron nitride, and it further shows that the semiconductor wafer chuck with a ceramic substrate with the porosity less than 5%, and, preferably from 0.01 to 3%. It would have been obvious to further adapt Ramanan with other suitable ceramic materials that display high thermal conductivity to maintain or increase the desired thermal capabilities, and further adapt with the claimed porosity to more effectively maintain the voltage drop in the ceramic substrate to improve the chucking of a wafer to the heating surface.

3. Claims 8, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanan in view of Hiramatsu or Ito as applied to claims 1, 2, 3, 4, 6 and 9-14 above, and further in view of Kadomura et al (US 5,968,273).

Ramanan in view of Hiramatsu or Ito shows the structure claimed except the metal is selected from the claimed materials.

Kadomura shows the metal plate (2) having the claimed aluminum silica carbide composite material. Kadomura further shows that the metal plate would display the over 100 W/mk or more thermal conductivity.

In view of Kadomura, it would have been obvious to one of ordinary skill in the art to adapt Ramanan, as modified by Hiramatsu or Ito, with the metal plate having the claimed materials to provide alternatively suitable heat transfer means either to heat or cool the thermal energy from the susceptor.

***Response to Arguments***

4. Applicant's arguments filed 3/15/06 have been fully considered but they are not persuasive.

The applicant argues Ramanan shows the cooling member (26) that is vertically shifted into and out of thermally conductive contact with the bakeplate and does not show the recited mechanically attached susceptor and the metal plate. This argument is not deemed persuasive since as the bakeplate, which is made of ceramic, comes in contact with the cooling member, which is made of metal, they are mechanically attached and bonded together. The showing of such members capable of being shifted and being apart vertically do not teach away the claimed recitation of the members being "mechanically attached" to each other. Furthermore, as they are come together, they are fastened by bonding. It is also noted, however, that the means by which they are fastened is a process by which the members are formed and such recitation is considered to be a process by product claim, and there is no other claimed structure element that would be distinguished from that of Ramanan.

The applicant argues that the cooling member (26) of Ramanan functions as cooling and not for reflecting heat as recited by the claims. While Ramanan terms such member as a cooling member, it would also reflect heat as could be done by the applicant's metal plate. Both being a metal plate, which also further has the thickness greater than that of the ceramic layer, the

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cooling member (26) is capable of promoting diffusion of heat as is done by the claimed metal plate. It is also noted that there is no claim recitation for "heat-reflecting" in the claims.

With respect to Kadomura, the recited metal plate is taught by the metal plate (2) of Kadomura which shows the claimed material that is capable of transferring heating or cooling energy from the heater chuck (3).

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S.P.

Sang Y Paik  
Primary Examiner  
Art Unit 3742

syp